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Flame Ionization Detector on a 6820 GC, Accessory G4312A

Installation Guide

This installation guide provides procedures for installing a Flame Ionization Detector (FID) on an Agilent 6820 Gas Chromatograph (GC). Before following these procedures, refer to safety information at the end of this document.

Parts list

Description	Quantity
T-20 Torx screw M4	1
1/8-inch front ferrule brass	3
1/8-inch back ferrule brass	3
Nut 1/8-inch brass tubing	3
Cable tie 100 × 3 mm	4
Nut warmer cup assembly	4
Nut warmer insulation (19234-60715)	3
Nut warmer insulation (G1176-01006)	1
Micro switch cable assembly	1
FID sticker - English	1
FID sticker - Chinese	1
FID body	1
FID interface board	1
FID ship kit	1

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Tools

- Electrostatic protection such as a grounded wrist strap
- T-20 Torx screwdriver
- Diagonal cutter
- 7/16-inch wrench

Configuration considerations

To achieve a standard factory configuration, it may be necessary to move an already existing detector. For a two-detector configuration, factory placement rules are as follows:

- A thermal conductivity detector (TCD), if present, is always placed in the front location.
- An FID, if present, is always placed in the back location.

Steps

1. Preparing the GC
2. Positioning and Securing the Detector
3. Connecting the Detector
4. Installing the Flow Control Module
5. Installing the Ignitor Extension Cable
6. Installing the Insulation Cup
7. Restoring the GC to Operating Condition

Preparing the GC

WARNING **Hazardous voltages are present in the mainframe when the GC is connected to electrical power. Avoid potentially dangerous shock hazards by disconnecting the power cord before removing the side panels.**

1. Switch off electrical power to the GC and disconnect the power cord. Allow time for the oven and heated zones to cool. Then switch off supply gases at their sources.
2. Remove column(s) and any associated hardware from inside the column oven.
3. Lift the hinged GC top cover at its front edge to expose the detector area. Remove the cover by raising it to vertical, lifting its left hinge pin from its bracket, and then sliding the cover to the left to free its right hinge pin.
4. Remove two screws along the lower edge of the left side (flow control) panel. Slide the panel slightly to the rear and lift it off.

CAUTION Electronic components can be damaged by static electricity; use a properly grounded static control wrist strap when removing the electronics panel.

5. In the same manner, remove two screws along the lower edge of the right side (electronics) panel. Slide the panel slightly to the rear and lift it off.
6. Remove the back panel by removing two screws at its bottom edge, loosening two screws at its top edge, and the lifting off the two top screws.

7 Finally, remove the rear top cover by removing four screws, two at each end.

8 At this time, if necessary to achieve a standard factory configuration, completely remove an existing detector and reinstall it into its required location. If an existing detector is being completely replaced by this new detector, carefully store the old detector assembly and all associated parts in a safe place for possible future use.

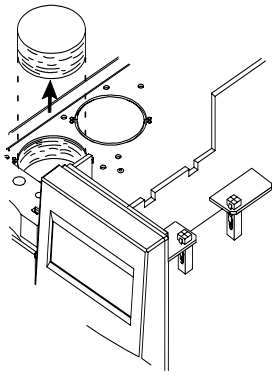
Positioning and Securing the Detector

CAUTION It is neither necessary nor advisable to separate a detector from its flow control module, as doing so may cause leaks. Although handling the detector and connected flow module as a unit is awkward, it can be managed.

1 If necessary, remove the round metal cutout on the oven top from the detector position to be used. Cut the metal circle with diagonal cutters so its nibs are connected to the piece removed. Discard the cutout.

CAUTION GC insulation is made of refractory ceramic fibers. Ventilate your work area. Wear long sleeves, gloves, safety glasses, and a disposable dust/mist respirator. Dispose of unneeded insulation in a sealed plastic bag.

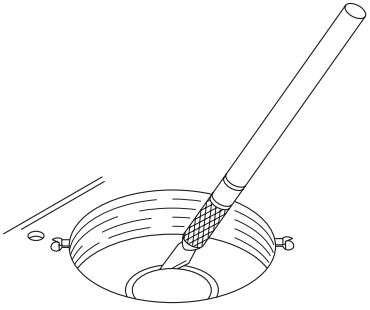
2 If necessary, lift out the die-cut insulation plug from the detector position to be used.



CAUTION Be careful to remove only insulation within the scribed circle.

3 Carefully remove the scribed circle of insulation from the oven top to create an opening into the oven.

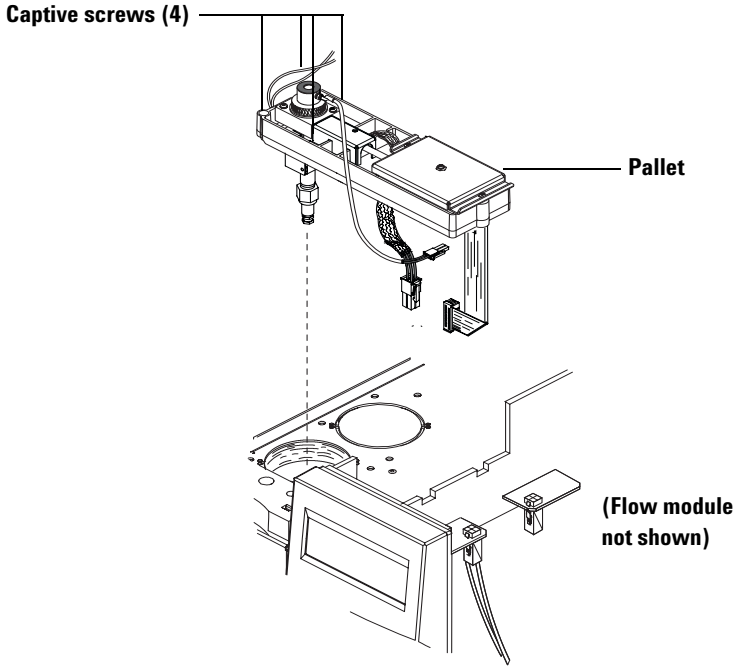
Method 1: Use a sharp knife to cut out insulation using the scribed circle as a guide.



Method 2: Pierce the insulation with a screwdriver. Rotate the screwdriver around the edge of the scribed circle to remove excess insulation. Remove any pieces of insulation which fall inside the oven.

4 While positioning the detector into the cavity, use both supplied insulation and removed oven insulation to pack around the bottom and sides of the detector. The goal is to fill all voids around the detector body as it is placed into the cavity.

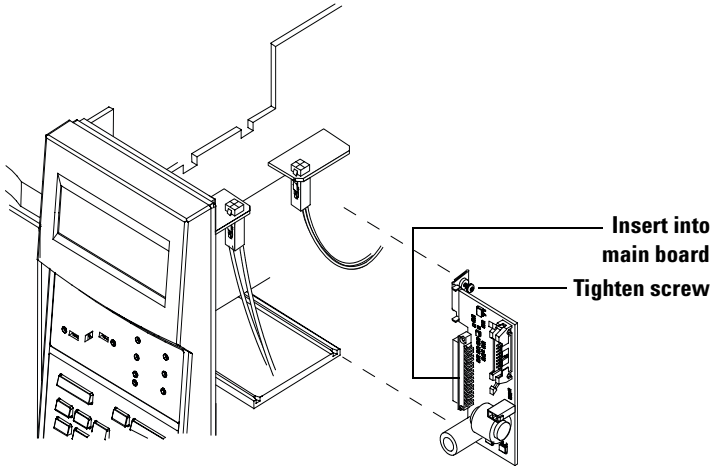
5 Partially tighten the four pallet screws with a T-20 Torx screwdriver, then tighten them evenly.



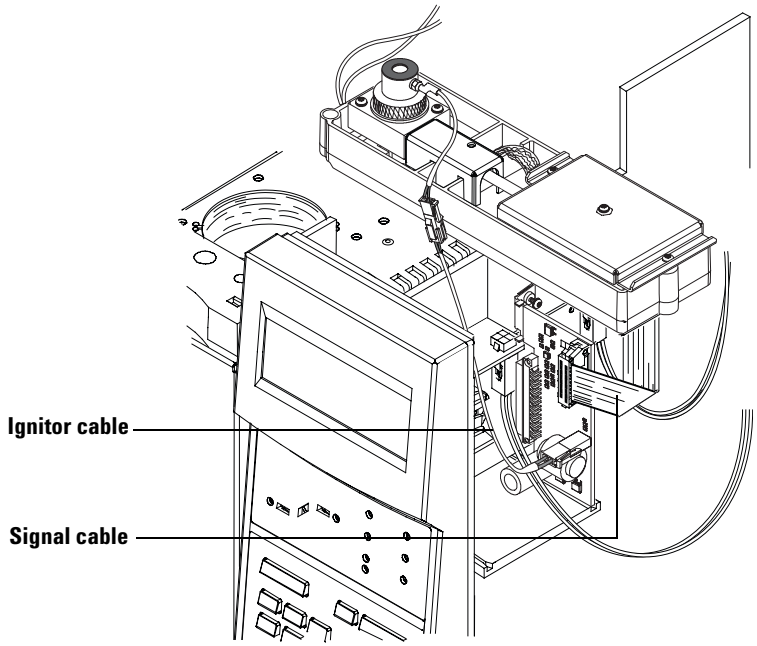
Connecting the Detector

CAUTION Printed circuit board components can be damaged by static electricity; use a properly grounded static control wrist strap when handling the detector board.

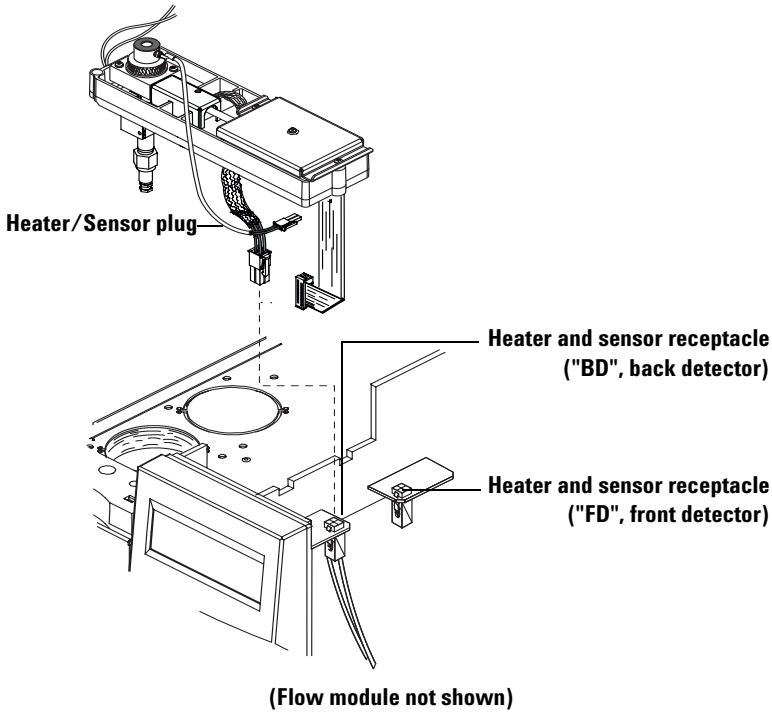
1 Remove the PC board from its antistatic bag and slide it fully into the slot and main circuit board connector associated with the installed detector. Tighten the screw on the PC board bracket with a T-20 Torx screwdriver to secure the board.



2 Attach the signal cable and ignition wire to the PC board.



3 Connect the heater/sensor plug to the square receptacle closest to the installed detector ("FD" for front detector, or "BD" for back detector).


Heater/Sensor plug
Heater and sensor receptacle ("BD", back detector)
Heater and sensor receptacle ("FD", front detector)
(Flow module not shown)

Installing the Flow Control Module

This section describes installation of the detector flow control module.

CAUTION It is neither necessary nor advisable to separate a detector from its flow control module, as doing so may cause leaks. Although handling the detector and connected flow module as a unit is awkward, it can be managed.

1 Determine the correct location for the detector flow control module:

- **Detector in the front position–** use the upper detector flow control module location.
- **Detector in the back position–** use the lower detector flow control module location.

CAUTION Handle the module carefully to avoid damaging its components and/or connected tubing.

2 Remove the existing detector label plate sticker from the module location to be used and install the new one provided.

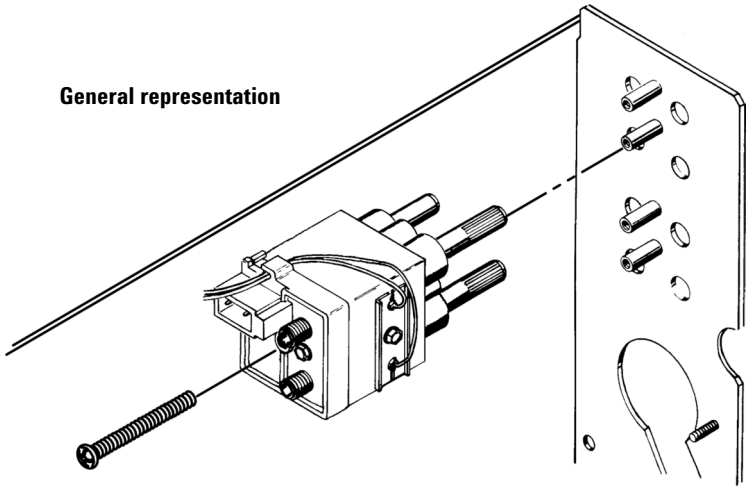
3 Route hydrogen and air tubing between the flow module and detector alongside existing tubing and wiring located behind the oven top and through either slot to the detector. Avoid making sharp bends in the tubing.

4 At the same time, route the open-ended air vent tube from the flow module towards the rear of the GC along the inside of the flow control portion (left side) of the instrument. The tube should be routed to be as straight as possible.

5 Verify that the three valves on the flow module are in their respective midway positions (rotated fully clockwise to a stop, then rotated two to three turns counterclockwise) and then slide the module onto two studs provided at the rear of the flow panel.

6 Secure the module with a 1-3/4-inch screw. The screw passes through a hole at the center of the rear of the flow module.

General representation



7 Refer to your 6820 *Getting Started* or *Service* manual both for factory standard plumbing configurations and for proper swage techniques to connect hydrogen and air supply gases to the installed detector flow module.

Installing the Ignitor Extension Cable

Installing ignitor wiring for this new FID depends upon whether this FID is the first FID installed on the GC, or if this FID is being installed as a replacement or as a second FID:

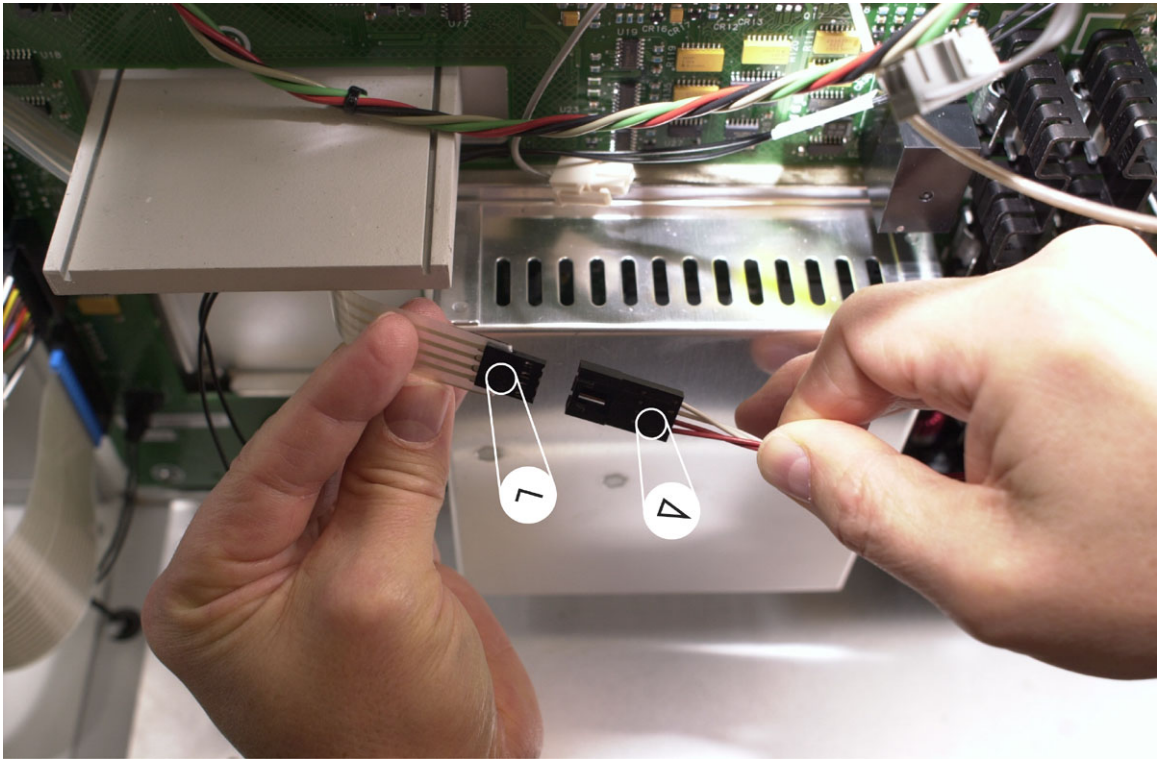
- If this is the first FID installed on the GC, continue with the following procedure to install the ignitor extension cable.

- If this is a replacement FID, or is a second FID, then the ignitor extension cable should be already installed. Go to step 3 in the following procedure.

1 Route the 4-wire (two red and two white) ignitor extension cable assembly along existing wiring and tubing located behind the oven top:
   - Note that the flat, single connector is routed to the electronics (right) side of the GC while the end with four separate "push-on" connectors is routed to the flow control (left) side.
   - Route the end with the flat, single connector to be located below the previously-installed FID printed circuit board. Route the end with the four separate "push-on" connectors to be located at the rear of the previously-installed flow control module.

2 Connect the flat, single connector on the ignitor extension cable to its mating connector found on a "ribbon" cable leading to the keyboard assembly.

- The two connectors must be joined in the proper orientation for correct ignitor operation; align the small triangle found on the FID ignitor extension cable connector with the number **1** found on the ribbon cable connector, then push the two connectors fully together.



3 In the flow control (left side) portion of the GC, note labeling and wire colors for the four separate "push-on" connectors located near the detector flow control modules:

- If the previously-installed flow module is in the upper detector position, select the red pair of wires (labeled "FRONT") and push each connector onto an electrical terminal at the back of the flow module (no polarity).

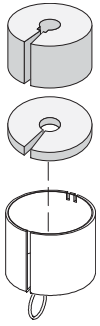
- If the previously-installed flow module is in the lower detector position, select the white pair of wires (labeled "BACK") and push each connector onto an electrical terminal at the back of the flow module (no polarity).

In either case, there is no polarity concer; either connector may be used on either terminal.

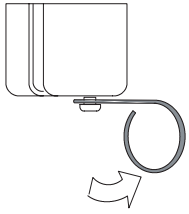
4 Use cable ties to secure the cable and previously-installed FID tubing to existing wiring and tubing running behind the oven top.

Installing the Insulation Cup

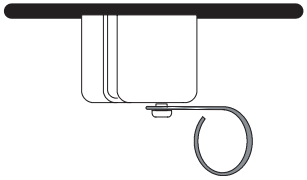
1 Install insulation into the cup.



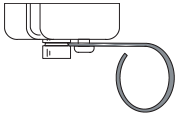
2 Push the wire spring lever at the bottom of the cup to the right to uncover the hole.



3 From inside the oven, place the cup over the detector fitting so its top edge touches the top of the oven.



4 Release the spring while making certain it fits into the groove in the detector fitting.



Restoring the GC to Operating Condition

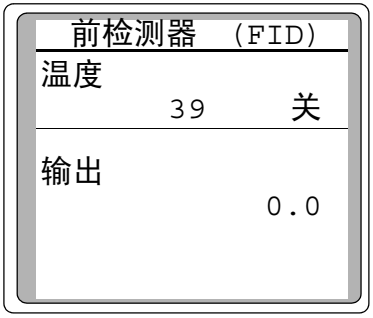
1 Restore gas supplies and check for leaks, particularly at all new connections. Follow the leak test procedures described in your 6820 *Maintenance and Troubleshooting* manual.

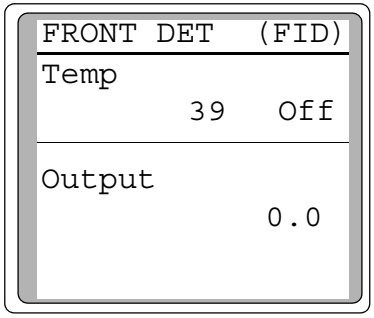
2 Reinstall GC covers and panels.

3 Restore GC electrical power.

4 Switch off electrical power, then switch it on again to ensure the new configuration is properly retained in GC memory.

5 Press [**前检测**] or [**后检测**] ([**Front Det**] or [**Back Det**] , respectively). If the detector has been properly installed, you will see the following display:





6 Verify detector operation by following the checkout procedure described in your *Getting Started* manual.

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Notices

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CAUTION

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